

In the Abstract:

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ABSTRACT

-- The present invention identifies a formulation for a subgroup of perovskite structure oxides that overcomes the outstanding problems for oxygen sensing in a combustion environment. The sub group has a formula ABO_x where A is a large 3-valent ion, such as Pr^{3+} , B is a transition metal ion, which is substituted to a small degree by tungsten (which has a stable valence of 6), and x indicates that the oxide can sustain a variable oxygen stoichiometry. A preferred general formulation is a single-phase perovskite structure $\text{AB}_{1-y}\text{W}_y\text{O}_x$ where y preferably lies between 0.03 and 0.15, more preferably between 0.05 and 0.10 and where x is close to 3. Preferred examples of compositions that can achieve these advantages include, but are not limited to, $\text{PrFe}_{0.95}\text{W}_{0.05}\text{O}_x$ and $\text{LaFe}_{0.95}\text{W}_{0.05}\text{O}_x$.--